

PATENT APPLICATION SERIAL NO. _____

U.S. DEPARTMENT OF COMMERCE
PATENT AND TRADEMARK OFFICE
FEE RECORD SHEET

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01 FC:201 395.00 OP
02 FC:203 330.00 OP

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December 1, 1997

Assistant Commissioner of Patents and Trademarks
BOX PATENT APPLICATION
Washington, D.C. 20231

Re: Inventor: Richard REISMAN
Attorney Docket No.: RR3
Title: COMPUTER-IMPLEMENTED TRANSPORT OF ELECTRONIC
INFORMATION OBJECTS
37 CFR 1.60 Continuation of: 08/251,724
Serial No.: Unknown
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SIR:
We enclose herewith:

- ☒ Patent Office 37 CFR 1.60 Continuation Application Transmittal Letter
- ☒ Copy of Prior Patent Application 08/251,724 including Declaration form
- ☒ Preliminary Amendment
- ☒ Check for \$725.00
- ☒ Six (6) Sheets of Formal Drawings
- ☒ Acknowledgment Postcard

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Respectfully submitted,

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Reg. No. 26,275

1

1 A novel electronic information transport component can be
2 incorporated in a wide range of electronic information
3 products, for example magazine collections, to automate the
4 mass distribution of updates, such as current issues, from a
5 remote server to a wide user base having a diversity of
6 computer stations. Advantages of economy, immediacy and
7 ease of use are provided. Extensions of the invention
8 permit automated electronic catalog shopping with order
9 placement and, optionally, order confirmation. A server-
10 based update distribution service is also provided.

ABSTRACT

1 A novel electronic information transport component can be
2 incorporated in a wide range of electronic information
3 products, for example magazine collections, to automate the
4 mass distribution of updates, such as current issues, from a
5 remote server to a wide user base having a diversity of
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7 ease of use are provided. Extensions of the invention
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10 based update distribution service is also provided.

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**COMPUTER-IMPLEMENTED TRANSPORT OF ELECTRONIC
INFORMATION OBJECTS**

TECHNICAL FIELD

- 1 The present invention relates to computer-implemented
2 transport of electronic information objects. More
3 specifically it relates to information transport software
4 which can be used for transporting information objects
5 between a remote server and any one of multiple,
6 uncoordinated intelligent computer workstations. Still more
7 particularly, it provides a computer-implemented software
8 component that can be used to facilitate the distribution of
9 information objects from a remote source to a large number
10 of customers or subscribers.

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BACKGROUND

Electronic publication is an exploding industry in which thousands of new products including magazines and periodicals, software applications and utilities, video games, business, legal and financial information and databases, encyclopedias and dictionaries are purchased by millions of customers. Commonly, such information products are replicated in computer-readable form on magnetic or optical storage diskettes and are box-packaged with printed manuals for distribution to retail stores and direct mail sales. These marketing practices are relatively expensive and involve a significant time lag of at least days or weeks to get a product into a consumer's hands once it is created.

Such costs and delays are generally acceptable for original, high value products such as collections of publications or software application, of which some examples are NEWSWEEK® Interactive CD-ROM, or disks, which provides a searchable audio-visual library of issues of NEWSWEEK magazine and CINEMANIA® CD-ROM which provides reviews and other information on newly released films. For time-sensitive, low-value updates, for example, the latest issue of Newsweek or last week's movie reviews, distribution in stored form, on physical media, is slow and the cost may exceed the value of the information in the product.

1 Thus, electronic transfer from a central computer server to
2 a subscriber's computer over common carriers or wide area
3 networks is an attractive proposition. Similar
4 considerations apply to the distribution of software program
5 updates, although cost and frequency of issue are not such
6 serious constraints. A problem faced in both situations is
7 that of incorporating the received material with the
8 original material so that a fully integrated publication,
9 information database or software program is obtained by the
10 user.

11
12 Another class of electronically distributed information
13 product comprises home shopping catalogues of mail order
14 products distributed on optical or other digital data
15 storage disks which may contain text, sound and images from
16 printed catalogues or uniquely created material, for example
17 software application demos. To applicant's knowledge and
18 belief, available products lack any computer order placement
19 capability, requiring orders to be placed by voice call.

20
21 Communication between remote computers, not directly
22 interconnected by umbilical cable or a wired network, is
23 enabled by a wide range of hardware devices and software
24 drivers, utilities, applications and application modules.
25 Telephone modems that couple a computer with the telephone
26 network are familiar devices. RF modems that couple

1 computers into wireless networks are less familiar but are
2 beginning to appear in consumer devices known broadly as
3 personal information communicators (PIC's) of which personal
4 digital assistants (PDA's) such as Apple Corp.'s NEWTON®
5 product are a first generation. New kinds of digital
6 communications devices can be expected to emerge as digital
7 technology replaces analog transmission.

8
9 General-purpose, online, modem-accessed, electronic
10 information services, such as PRODIGY, COMPUSERVE and
11 AMERICA ONLINE (trademarks), and some Internet services,
12 provide wide access to timely information products from a
13 central server, but are limited and complex. They provide
14 no means for the integration of downloaded information with
15 information products offered on disk or CD, and provide only
16 rudimentary facilities for local viewing and search of
17 downloaded files.

18
19 Such online information services provide their own user
20 interface which is generally unlike that of a disk or
21 CD-based information product, and can be customized very
22 little, if at all, by a publisher using the service for
23 product distribution.

24
25 Online services are oriented to extended online sessions
26 which require complex user interaction to navigate and find

1 desired information objects. Initial setup and use is
2 rendered complex by requirements related to extended session
3 use of data networks and the frequent need to navigate
4 across the network, and through massive data collections, to
5 locate desired data items. General-purpose online
6 information services do not provide a suitable medium for
7 electronic information publishers to distribute updates, and
8 the like, because of limited interface flexibility, because
9 a publisher cannot expect all their customer base to be
10 service subscribers, and because of cost and payment
11 difficulties. Such services are centered on monolithic
12 processes intended for national use by millions of
13 subscribers which processes are not readily adaptable.
14
15 Online service charging mechanisms are also inflexible and
16 inappropriate for most individual information products,
17 requiring monthly subscription fees of \$5-10 or more, plus
18 time charges for extended use, which are billed directly to
19 users, after a user sign-up and credit acceptance process.
20 Such cost mechanisms are too expensive and too complex for
21 distribution of many products such as magazine and other low
22 cost update products. They do not presently permit a
23 publisher to build an access fee into a purchase price or a
24 product subscription.
25
26 Recent press announcements from corporations such as AT&T,

1 Lotus, Microsoft and MCI describe plans for new online
2 services providing what are called "groupware" services to
3 offer rich electronic mail and group collaboration
4 functions, primarily for business organizations. Although
5 offering multiple electronic object transport operations
6 such services are believed to have complex setup procedures
7 and software requirements and complex message routing
8 features and protocols, and to lack interface flexibility.
9 Accordingly, they are not suitable for mass distribution of
10 low cost electronic information update products and cannot
11 achieve the objectives of the invention.

12
13 Communications Products

14 Many software products exist that enable one computer to
15 communicate with another over a remote link such as a
16 telephone cable or the air waves, but none enables a vendor
17 substantially to automate common carrier mass distribution
18 of an electronic information product to a customer base
19 employing multiple heterogenous systems with indeterminate
20 hardware and software configurations. Two examples of
21 popular such software products are Datastorm Technologies,
22 Inc.'s PROCOMM (trademark) and CENTRAL POINT COMMUTE
23 (trademark) from Central Point Software, Inc. which are
24 commonly used to provide a variety of functions, including
25 file transfers between, interactive sessions from, host-mode
26 services from, and remote computer management of, modem-

1 equipped personal computers wired into the telephone
2 network.

3

4

5 Counterpoint Publishing's Federal Register publications

6 Counterpoint Publishing, (Cambridge MA) in brochures
7 available to applicant in November 1993 offered electronic
8 information products entitled "Daily Federal Register" and
9 "CD Federal Register". "Daily Federal Register" includes
10 communications software and a high-speed modem. Apparently,
11 the communications software is a standard general purpose
12 communications package with dialing scripts that are
13 customized to the needs of the Federal Register products.
14 Accordingly, the cost of a communications package license
15 which may be as high as about \$100 at retail must be
16 included with in the product cost. Also, Counterpoint
17 Publishing avoids the difficulties of supporting various
18 modems by providing its own own standard modem, with the
19 product, building in a cost (about \$100-200) which renders
20 this approach quite unsuitable for mass-market distribution
21 of low cost electronic information update products. The
22 resulting product is not seamless either in its appearance
23 or its operation because the communications software is
24 separately invoked and used, and has its own disparate look
25 and feel to the user.

26

1 The "CD Federal Register" provides the Federal Register on
2 CD-ROM at weekly intervals for \$1,950.00 and CD-ROM disks
3 are shipped to customers as they become available. Back
4 issues are \$125 each. Updates are provided by shipping a
5 disk. The Federal Register is a high-value product intended
6 for specialist, business, academic and governmental users.
7 Distribution of updates on CD-ROM, as utilized by
8 Counterpoint Publishing, is not a suitable method for lower
9 value products such as a weekly news magazine, because of
10 the associated costs. Shipping delays are a further
11 drawback.

12
13 While the two product "CD Federal Register" and "Daily
14 Federal Register" might be used together, at an additive
15 cost, to provide a combination of archives on CD-ROM plus
16 daily updates obtained and stored until replaced by a new
17 CD-ROM, based on information available to the present
18 inventor it appears that the two products must be used
19 separately. Thus they must apparently be viewed, searched,
20 and managed as two or more separate collections, requiring
21 multiple steps to perform a complete search across both
22 collections, and requiring manual management and purging of
23 the current collection on hard disk by the user.

24
25 Xcellenet's "REMOTWARE"®

26 Xcellenet Inc. in product brochures copyrighted 1992 and a

1 price list dated August 16, 1993, for a "REMOTWARE"®
2 product line, offers a range of REMOTWARE® software-only
3 products providing electronic information distribution to
4 and from remote nodes of a proprietary REMOTWARE® computer
5 network intended for use within an organized, corporate or
6 institutional data processing or management information
7 system. The system is primarily server directed, rather
8 than user initiated and requires an expensive program
9 (priced at \$220.00) to run at the user's node whereas the
10 present invention addresses consumer uses which will support
11 costs of no more than a few dollars per node.

12
13 Further, REMOTWARE® is primarily intended to be used with
14 other REMOTWARE® products at the node which other products
15 provide a range of user interface and data management
16 functions, at significant additional cost, each with their
17 own separate user interface presenting a standard
18 REMOTWARE® look and feel. In addition, the nodes require a
19 sophisticated central support and operations function to be
20 provided, which may be difficult for an electronic
21 information publisher to accomplish and add unacceptable
22 expense.

23
24 REMOTWARE® is overly elaborate to serve the simpler
25 objectives of the present invention. Designed for the
26 demanding needs of enterprise-wide data processing

1 communications, the client or node package provides many
2 functions such as background operation, ability to receive
3 calls from the server at any time, ability to work under
4 control of the central server to survey and update system
5 software and files and an ability to support interactive
6 sessions, which abilities are not needed to carry out the
7 simpler information transport operations desired by the
8 present invention. Such capabilities may be desirable in an
9 enterprise MIS environment, but are not appropriate to a
10 consumer or open commercial environment, and bring the
11 drawbacks of complexity, cost, and program size, which may
12 put undesirable operational constraints on the user (and
13 perhaps even compromise the user's privacy). REMOTEWARE® is
14 too costly and complex for mass distribution of updates to
15 periodicals, cannot be shipped invisibly with an electronic
16 information product and requires specialized server software
17 and operations support that would challenge all but the
18 largest and most technically sophisticated publishers.
19 Accordingly, REMOTEWARE® is unsuitable for widespread use as
20 an economical means of distributing updates for a variety of
21 electronic information products.

22
23 Although it has wider applications, a significant problem
24 addressed by the invention is the problem of economically
25 distributing updates of electronic information products to a
26 wide customer base that may number tens or hundreds of

1 thousands, and in some cases, millions of consumers. At the
2 date of this invention, such a customer base will normally
3 include an extensive variety of computers, operating systems
4 and communications devices, if the latter are present, all
5 of which may have their own protocols and configuration
6 requirements.

7

8 While an electronic information product vendor might
9 consider licensing or purchasing an existing commercial
10 communications product for distribution with their
11 publication product to enable remote, diskless updating, the
12 high cost of such a solution would generally be unacceptable
13 because a communication package includes a broad range of
14 functionalities not required for the vendor's particular
15 purpose, for example, remote keyboarding. Significantly, a
16 commercial communications package is not susceptible to
17 customization of its user interface and may have its own
18 configuration requirements and installation requirements,
19 with regard to directories, device drivers and the like,
20 which are incompatible with other vendor or user
21 requirements or are simply a nuisance to the user. Thus, a
22 commercial communications product in addition to its cost,
23 cannot be satisfactorily integrated with an information
24 product.

25

26 There is accordingly a need for computer-implementable

1 information transport software to enable simple, economical
2 and prompt mass distribution of electronic information
3 products.

4

5

SUMMARY OF THE INVENTION

6 This invention solves a problem. It solves the problem of
7 enabling simple, economical and prompt mass distribution of
8 electronic information products.

9

10 The invention solves this problem by providing a computer-
11 implemented information transport software module usable
12 with any of multiple electronic information products for
13 mass distribution of electronic information objects to users
14 of a diversity of uncoordinated communications-equipped
15 computer stations. The information transport software
16 module is readily customized to an individual information
17 product to have a user interface in said information product
18 for activation of automated transport of an information
19 object between a remote object source and a user's computer
20 station. The information transport module contains user
21 communications protocols specifying user station functions
22 of the automated object transport and the object source is
23 supplied with source communications protocols specifying
24 source functions of the automated object transport. The
25 source communications protocol is co-operative with the user
26 communications protocol and knows the characteristics of the

1 user communications protocol, so as to be able to effect the
2 information object transport in unattended mode after
3 initiation.

4

5 Preferably, for economy and simplicity, the information
6 transport component is supplied for incorporation in an
7 information product as a free-standing embeddable component
8 comprising only such functionality as is required for the
9 aforesaid information object transport operation as that
10 operation is described above and as further elaborated

11 herein. In a preferred embodiment, by limiting available
12 functionality to predetermined transport operations, for
13 example to information object transport between the user's
14 address and one or more pre-specified remote addresses, or
15 to transport of a pre-specified information object or
16 objects, or by making both such limitations, a lean and
17 efficient information transporter product can be provided.

18 This enables an information product vendor to supply an
19 automated, or unattended, update or other information
20 transport facility to a mass market of computer users
21 without the complexity and expense of proprietary network or
22 communications software packages, or of the vendor
23 developing their own transport software.

24

25 In a local area network, users communicating across a common
26 medium such as ETHERNET (trademark), or TOKEN RING

1 (trademark) can enjoy the relatively expensive benefits of
2 coordination of traffic between users, and to and from
3 network services, which benefits are provided by a network
4 operating system such as LANTASTIC (trademark, Artisoft
5 Corp.) or NETWARE (trademark, Novell, Inc.). In contrast, a
6 mass market of computer users lacks coordinating means for
7 the facilitation of remote communications between the users
8 and a would-be provider of services to those users. The
9 inventive information transport component, or transporter,
10 efficiently fills that need. While the invention might be
11 implemented for transport across a local area network, such
12 use would probably be incidental to the provision of other
13 services and may not be needed having regard to the
14 sophisticated functions usually provided by relatively much
15 more expensive local area network communication systems.

16
17 Typical communications equipment comprises a modem, but
18 other cards and devices enabling remote communication
19 between computers may be used, such as devices or means
20 permitting communication in a digital rather than analog
21 realm, for example, ISDN or ATM interfaces when they become
22 commercially viable.

23
24 Preferably, the user communications protocols specify
25 parameters such as a source address, which may be a common
26 carrier address, such as a telephone number, and object

1 parameters such as file name or names, file size, location
2 content and format are specified, as appropriate, in either
3 the user communications protocols or the source
4 communications protocols, or both. Such object
5 specification can be listed in an object manifest stored at
6 the user's station, which preferably, for better control of
7 the transport operation, is sent to the remote object source
8 as a verifier.

9

10 By pre-specifying the desired transport functions to both
11 ends of the transport operation, the user and the object
12 source, a simplified, easy-to-use, automated transport
13 operation which conveys an information object in unattended
14 mode, after initiation, can be provided to any user.

15

16 The inventive information transport module provides an
17 information product vendor with simplicity, modularity and
18 generality enabling information fetch operations to be
19 easily executed by novice users, and permitting inclusion in
20 a wide range of information products with a minimum of
21 customization. The invention is accordingly most suitable
22 for electronic publishers to employ to enable their
23 customers easily to update information products such, for
24 example, as periodical collections, patent collections or
25 software furnished on optical, magnetic or other storage
26 devices.

1 In a preferred embodiment of the invention, the information
2 object is pre-identified and integratable with the
3 information product to which the transport module is
4 customized to provide an augmented information product and
5 the information transport component comprises:

- 6 a) a fetcher module configured to fetch said pre-
7 identified object from said object source
8 employing a pre-specified common carrier address
9 stored in said fetcher module;
- 10 b) a communications manager to establish and manage
11 connection to said object source under control of
12 said fetcher module and with the assistance of
13 said user and source communications protocols; and
14 c) a fetched object integrator to locate a fetched
15 object in a preset file area accessible to and
16 known to said containing information product;

17 wherein said object pre-identification, said common carrier
18 address and said preset file area specifications are stored
19 in said software component, whereby a workstation user of
20 said information product can automatically effect transport
21 and integration of a pre-identified object from said object
22 source to create an augmented information product at said
23 workstation.

24
25 In this embodiment, any user can, easily and with varying
26 degrees of automaticity, up to complete automation after

1 initiation of transport or upon arrival of a scheduled
2 transport time, obtain an update object and smoothly
3 integrate it with an original product or product shell.
4

5 In a highly automated embodiment a containing information
6 product, complete with transporter, is pre-coded with an
7 update, reporting, or other schedule and, referencing the
8 user's system clock, prompts the user for initiation of a
9 transport operation at a scheduled date after distribution
10 of the containing product, or fetches a schedule. If the
11 user's system is shut down when the pre-scheduled date
12 arrives, such prompt may be made at the first system boot or
13 product use after that date.
14

15 The invention provides a closed-ended information transport
16 operation between an information object source and any
17 subscribing user, with no special commands or menu
18 selections, which functions efficiently and, within the
19 general parameters of an operating system's required
20 environment, operates independently of the user's system
21 configuration. Information transport operations are carried
22 out automatically between communications modules that know
23 what to expect from each other, avoiding difficulties
24 arising from open-ended communications with a wide variety
25 of users employing a diversity of heterogenous systems.
26

1 In another aspect, the invention provides a method of
2 distributing predetermined electronic information objects
3 from a remote object source to users of a diversity of
4 uncoordinated modem-equipped computer stations, said method
5 comprising:

6 a) supplying said users with an information transport
7 module containing user communications protocols
8 specifying user station functions of an automated
9 object transport operation; and

10 b) supplying said remote object source with a source
11 information object and source communications
12 protocols specifying source functions of the
13 automated object transport operation, said source
14 communications protocol being co-operative with
15 the user communications protocol to effect said
16 information object transport operation;

17 whereby said transport operation can proceed automatically
18 after initiation at said user's station.
19

20 The inventive distribution software module and the original
21 information product are linked together to interact
22 seamlessly. It is possible for transport of the update to
23 proceed in a high level format facilitating integration of
24 the update object with the original product, and the
25 invention also provides methods and software for effecting
26 such integration.

1 A broad objective of the invention which can be fulfilled by
2 the methods and products disclosed herein is to allow a
3 computer user to fetch and use an information product
4 update, or even an original information product for which
5 they have previously received a transporter kit, with a
6 minimum of effort, and preferably with the impression that
7 the fetch function is an integral capability of the
8 information product itself, rather than being executed by a
9 separate or separable component.

10

11 Another objective is to enable information transport to be
12 easily effected across any of a selection of media or
13 carriers, desired by the containing information product
14 supplier. To this end the information transport component
15 can provide protocol selection means for selecting media for
16 real time communication between said user and said remote
17 object source employing a selection from a set of open-ended
18 network technologies and network providers, said
19 communication means being selectable without substantive
20 change to said containing information product.

21

22 In preferred embodiments, after setup of a containing
23 information product and a simple menu-selection activation
24 of a transport operation to occur immediately or at a
25 subsequent date, or time, and subject to the occurrence of
26 error conditions, the information transport component

1 effects the transport operation in an unattended manner, or
2 without user intervention, through the steps of modem
3 activation, dialing, network transit, handshaking with the
4 object source, file specification, file importation,
5 termination of the call and return of control to the
6 containing product.

7

8

transport-related

9 Preferably, additional ^{transport-related} steps such as sending back
10 verification of receipt of the fetched file to the object
11 source, inspection of the fetched object and comparison with
12 a pre-existing manifest for verification of object
13 parameters, and any necessary unpacking and decompression
14 are effected automatically, in an unattended manner without
15 user intervention. For seamless use of the object, it is
16 also preferred that application file specifications, any
17 necessary location or relocation of an object file or files,
18 and any reindexing, index creation or other product
19 integration function that is required to enable the user to
20 utilize the fetched object harmoniously with the original
21 information product, be performed automatically in
22 unattended manner without user intervention, or with minimal
23 user confirmation that one or more steps of the procedure
24 should be executed.

25

26 Should errors be detected, if critical, they are reported to

1 the user, and possibly also to the object source. If a
2 detected error is potentially recoverable, the novel
3 information transport component preferably takes action,
4 without seeking user confirmation (although in some
5 embodiments confirmation could be requested), to correct the
6 error, for example by redialling a phone call a specified
7 number of times, or by re-running an object fetch operation.
8 Should a new fetch object still fail to meet manifest
9 specifications, deviations may be reported back to the
10 object source with the user being alerted and, possibly
11 recommended to make a phone call.

12
13 Preferably also, the information transport component or
14 "transporter" performs a containerized, standard transport
15 operation, which is transparent to any high-level formatting
16 of the transported information object, and standard in the
17 sense that the transport operation can be essentially
18 repeated for a wide variety of different information
19 objects.

20
21 Preferred embodiments of the information transport component
22 can pack or unpack, compress or decompress, and send to or
23 fetch files from specified locations. The transporter
24 allows the containing information product to be set up
25 automatically to effect high-level integration of indexes
26 and navigational structures by letting the containing

1 product have control when needed to import or export (and
2 encrypt or decrypt) objects.

3
4 Preferably, the transporter has no direct effect on the
5 content of the data object. Such transparency is
6 advantageous in avoiding interdependency between the
7 transporter and possible use of novel data structures,
8 encryption or copy-control methods, or the like, by the
9 containing product. For example the transporter need not
10 know (and possibly jeopardize) any encryption technique.

11
12 In preferred embodiments of the invention, the module is
13 self configuring and has the ability to scan the user's
14 system, and preferably identifies the user's modem, or other
15 system components or configuration software, and
16 automatically set protocols such as the baud rate, bits
17 parity and the like. Relevant auto-configuring capabilities
18 and software that may be employed in practicing the
19 invention are offered or promised by Intel Corporation in a
20 brochure entitled "Intel Technology Briefing: Plug and Play"
21 copyrighted 1994, the disclosure of which is hereby
22 incorporated herein by reference thereto.

23
24 Preferably, the novel electronic information transporter is
25 seamlessly embedded in the containing product so that an end
26 user is unaware that the transporter can exist separately

1 from the containing product. However, it is a valuable
2 feature of the invention that the transporter be separable
3 from the containing product to be usable with other
4 containing products.

5

6 New or improved electronic information products are made
7 possible by the novel information transporter disclosed
8 herein, for example, CD-ROM-based products updated from
9 online services, updatable periodical magazine collections,
10 catalog-based computer shopping with order entry and
11 optionally, order confirmation.

12

13 Recently contemplated CD-ROM products updatable from online
14 services

15 A CD-ROM-based product with online service updatability
16 called "MICROSOFT Complete Baseball" (MICROSOFT is a
17 trademark) was announced by Microsoft Corporation apparently
18 on March 1, 1994, with a June 15, 1994 availability date. A
19 product brochure received by the present inventor on April
20 26 describes a multimedia history of baseball which can be
21 updated with daily scores from an online service, by modem.
22 Nothing in the sales materials suggests any separable
23 information transport components marketable for use with
24 other information products.

25

26 In late April 1994, CompuServe® (trademark) online
27 information service announced plans for a CD-ROM information

1 product to be used in conjunction with its online service.
2 The CompuServe® CD-ROM information product online service is
3 usable only with that service, and requires users of its
4 online component to be CompuServe® member/subscribers, on
5 terms such as described above, which terms restrict the CD-
6 ROM product's marketability. The CD-ROM content and user
7 interface is limited to that provided by CompuServe®.
8 Accordingly, such a dedicated CD-ROM service is not a
9 satisfactory solution to independent publishers looking for
10 economical update means, because they will be limited to
11 whatever user interface and data management flexibility the
12 online vendor may provide which will substantially restrict
13 any creative look-and-feel identity the publisher may have
14 provided in their own product. Thus the CD-ROM product is
15 described by CompuServe® in the statement: "It is,
16 essentially, a new window on CompuServe..." This product
17 description does not suggest an ability to obtain updated
18 online information for integrated local, offline use with an
19 original information product stored on the CD-ROM, as is
20 provided by the present invention.

21
22
23 In addition to CD-ROM-based products, various new
24 information distribution methods and services are made
25 possible by embodiments of the present invention. The
26 object source can be a remote server equipped with a

1 cooperative communications module closely molded to work
2 effortlessly with the information transporter for
3 distributing objects to a wide base of users. Such a remote
4 server can be linked to a vendor or gatewayed to other
5 information object sources or electronic publishers, and
6 exploit its smooth and efficient information transport
7 capabilities to act as a distribution point for such
8 vendors, sources or publishers.

9
10 Thus, the invention further comprises such a special-purpose
11 server designed for use with the novel information
12 transporter and the special-purpose server can be
13 established as a distribution service for publishers who
14 incorporate the information transporter in their products.
15 The invention also provides a method of operating a server
16 to provide such a software service and server-enabling
17 software.

18
19 **BRIEF DESCRIPTION OF THE DRAWINGS**

20 One way of carrying out the invention is described in detail
21 below with reference to drawings which illustrate only one
22 specific embodiment of the invention and in which:-

23
24 **Figure 1** is a schematic diagram of one embodiment of an
25 information transport software component according to
26 the invention installed in a computer workstation and

26

communicating with a complementary centrally located server-resident software module for mass distribution of digitized electronic information objects;

Figure 2 is a flow block diagram of an information transport operation performed by the software component and module of the embodiment of Figure 1;

Figure 3 is a schematic diagram of a server-based electronic distribution service employing an inventive information transport software component;

Figure 4 is a further schematic diagram of the service illustrated in Figure 3;

Figure 5 is a schematic diagram of a prior art communications product employed to transport an information object between a user and a remote server; and

Figure 6 is a schematic diagram similar to Figure 5 showing, in a comparative manner, some of the benefits that can flow to a user when an information transport software component, such as that described with reference to Figure 1, is used for a similar transport operation.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to Figure 1, the inventive software component is schematically shown in operative mode installed at a user's computer workstation. The workstation is communications-equipped for communication with remote services, for example by modem, which services are also shown schematically. Only relevant software and hardware components of the system are shown.

Relevant components at the workstation comprise operating system services 10, a containing information product 12, an information transport component or module 14, herein also referenced as a "transporter" which may be a stand-alone product or, in preferred embodiments is embedded or contained in the containing information product 12.

Information transport component 14 provides a general purpose facility for sending and fetching information objects between an end user's computer (the client) and a central server. Information transport component 14 is not customized to the containing information product 12, but is intended to be used in conjunction with any of a wide range of electronic information products.

Operating system services 10 provide capabilities for the containing information product 12 and the information transport component 14 to access a readable information

1 storage device 16 which may, for example, be an optical disk,
2 drive such as a read-only CD-ROM where product information
3 17 is stored. In addition, a read/write information storage
4 device 18, for example, a conventional hard disk is accessed
5 via the operating system services 10 for storage of a
6 fetched additional information object 26.

7
8 As necessary, different, or modified, information
9 transporter components 14 can be supplied for users of
10 different operating systems or system families, notably DOS
11 (available in several versions, for example from Microsoft
12 Corp, IBM Corporation, Novell, Inc.) Windows (trademark,
13 Microsoft Corp.), Apple Computer Corp.'s operating systems,
14 possibly IBM Corporation's OS/2 (trademark), and any
15 distinct operating systems developed for personal digital
16 assistants, pen-based computers and the like.

17
18 Information transport component 14 also uses operating
19 system services 10 for external communication with a
20 communications network 20 through which the information
21 transport component 14 can access a remote server 22, or
22 server-client network, supporting a data storage device 24
23 where desired additional information object 26 is located.

24
25 Communications network 20 can be any electronic distribution
26 system suitable for transporting information objects 26

1 including wired and wireless common carriers such as
2 telephone networks, cable television systems or networks and
3 mobile telecommunications or data communications networks
4 and extends also to emerging and future systems of providing
5 electronic communication between users of diversified
6 equipment. The term "common carrier" is used herein to
7 embrace all such data communication systems as will
8 reasonably meet the purposes of the invention. The term
9 "modem" is used herein to embrace any network interface
10 device enabling a user station to communicate on such a
11 communications network 20.

12
13 While the containing information product 12 can take many
14 different forms, as described herein, and as will also be
15 apparent to those skilled in the art, a preferred embodiment
16 is that of a periodically issuing publication or
17 publications, for example, a news magazine or a collection
18 of patents. Again, the additional information object 26
19 could be any information of interest to the user, having
20 some relevance to the containing information product 12, but
21 the invention and its unique capabilities enable the
22 additional information object 24 to be fully integrated with
23 the containing product 12 in a manner that can be automated
24 to be transparent to the user.

25
26 The inventive information transport component 14 is designed

1 to require a minimum of user input. A bare minimum will be a
2 user's ID which can be entered by the user in a product
3 setup and automatically accessed for information transport,
4 or could be pre-loaded by the vendor from data supplied by
5 the user at purchase.

6
7 A product ID is preferably pre-loaded into the containing
8 information product 12 by the information product vendor or
9 publisher to be available for use by the information
10 transport component 14. However, even this may not be
11 required. In an alternative embodiment, the product ID can
12 be automatically incorporated into the product in a product
13 replication process that permits individualized coding of
14 unique ID's. In most cases, a user-actuated menu selection
15 is provided in the containing information product 12 after
16 integration with the inventive information transport
17 component 14 to activate transport of an additional
18 information object, and preferably, selection of transport
19 activation drops down a menu of transport choices such as
20 "FETCH UPDATE", "FETCH CATALOG OF UPDATES", "SEND DATA" and
21 the like, each of which then runs automatically upon
22 selection.

23
24 Updating can also be totally automatic, and other than an
25 obviously desirable user notification, be completely
26 invisible to or transparent to the user, running in

1 background on their system, while the user's screen is
2 available for other processing such as running the
3 containing information product 12. Where updates are made
4 available on a known schedule, a totally automated product
5 can be provided that fetches an update without any user
6 intervention, on the specified release date, or as soon
7 thereafter as the user's system, or the containing
8 information product 12, is activated. In practice, most
9 users will probably prefer an opportunity to confirm that
10 the fetch transaction should proceed. A preferred
11 embodiment monitors the user's system clock and alerts a
12 user to the arrival of an update release date and asks the
13 user to confirm that the system should seek and fetch the
14 scheduled update, if available.

15
16 Thus, the invention is particularly suitable for importing
17 updates of information or information processing products,
18 such as periodically issuing literature, or software
19 upgrades. Accordingly, additional information object 24
20 preferably comprises updates which can be integrated with
21 the information product 12 to provide, for example, a
22 coherent body or continuous sequence of materials that can
23 be commonly searched and indexed preferably in a manner
24 giving the user the appearance of a common logical file
25 formed from physically distinct files. The appearance of
26 integration can be achieved by searching new and then old

1 indexes in series and making the search and navigation logic
2 of the containing product smart enough to combine new and
3 old information. For example a new object can have an index
4 file similar to that for the original information product
5 12. A search engine can first search the new index, then
6 the old one, and then produce a combined set of results.
7 Preferably, the files are not actually merged or otherwise
8 combined as to do so could be unduly complex.

9

10 As shown in Figure 1, the containing information product 12
11 comprises a user interface 28 enabling the user to view,
12 search, excerpt and print or otherwise export or process
13 selected information items from product information 17. The
14 user interface 28 provides standard information product
15 features, as conventionally supplied by the product
16 publisher, supplemented by appropriate fetch or send options
17 to activate the features of the inventive information
18 transport component 14.

19

20 Also shown in Figure 1 are a database management module 30
21 and a data structure definition module 32. Database
22 management module 30 provides retrieval-oriented database
23 processing of the information product including indexed
24 searching and selective retrieval capabilities using one or
25 more index keys such as an issue or item number, or full
26 text searching, and may provide hypertext and hypermedia

1 linkages. The data structure definition 32 provides the
2 database structure of relevant files as classified by field
3 or element, name, type, size and the like. After successful
4 completion of a fetch operation, control is returned to
5 containing information product 12 to process the new
6 information in essentially the same manner as the original
7 information, or in any other manner for which it has been
8 equipped.

9

10 Major modules comprised in the inventive information
11 transport component 14 are a user interface 34, a
12 communications module 36 and fetch-send protocol 38. In
13 addition, the information transport component 14 preferably
14 comprises its own built-in application programming
15 interfaces (APIs) such as a user interface API 40 and a
16 communications API 42, enabling the information transport
17 component 14's user interface and communications modules
18 respectively, readily to be incorporated with, or plugged
19 into a wide range of containing information products 14.
20 Such incorporation, in the currently best known embodiment
21 of the invention, is effected by software engineers familiar
22 with and having access to the containing information product
23 12, but future developments may enable the incorporation
24 process to be effected by skilled users.

25

26

1 References herein to an applications programming interface
2 (API) will be understood to embrace any program
3 interconnection technique which supports direct, seamless
4 interaction between one program and another, including
5 procedural calls, object encapsulation, or emerging
6 techniques like Microsoft Corp.'s Object Linking and
7 Embedding (OLE) or Apple Computer's Open Doc.

8
9 API 40 is responsible for providing means for the user to
10 interact with the information transport functions of the
11 invention and interface as seen by the user and API 42 is
12 responsible for handling internal processes of
13 communications and data management.

14
15 The APIs 40 and 42 are intended to enable the information
16 transport component 14 to be used by a range of product
17 programs controlling a variety of information products and
18 to enable each API 40 and 42 to be free to exercise
19 flexibility and creativity in extending its associated user
20 interface 28, data management module 30 and database
21 structure 32 to fully address the provision of transport
22 functions for the purposes described herein.

23
24 API 42 operates on a transport function level involving high
25 level interactions between the containing product 12 ~~or the~~
26 ~~user~~ (or the optional user interface) and the transporter 14

RL
5/21/11

1 before and after communications while the detailed low-level
2 interactions between the transporter client and the server
3 during communications are handled by fetch-send protocol 38,
4 without involvement of the containing product 12 or the
5 user. "High level" is used to refer to a level at which
6 software interacts with a user, typically in simple, readily
7 comprehensible, function-oriented, graphic or everyday
8 language terms, while "low-level" refers to a level of
9 detailed procedural interaction with an operating system, or
10 device (modem, port etc.) in obscure program or machine
11 language terms incomprehensible to most users.

12
13
14 Fetch-send protocol 38 is, in the preferred embodiment
15 shown, a component of a novel client-server communications
16 procedure designed to manage the transaction-oriented
17 transmissions required to achieve satisfactory transport of
18 desired server stored information objects, and optionally,
19 central reporting of user information in a predetermined
20 format. Alternatively, one or more existing protocols could
21 be used.

22
23 Preferably, the API's 40 and 42 and the fetch-send protocol
24 38 are structured to use a manifest list to control the
25 exchange of information objects. The manifest list can be
26 provided in fetch-send protocol 38, and can be forwarded to

1 remote server 22 to provide better efficiency, error
2 control, and management of the operation. Alternatively the
3 manifest list may remain resident at the user's station.
4 The manifest is valuable operating at the client station, at
5 the API level, to specify the actions required during a
6 transport session and can in one embodiment comprise a list
7 of send and fetch operations which are individually
8 controlled.

9

10 This software mechanism, employing novel communications
11 procedures and applications interfaces that reference an
12 object manifest, provides a new way for performing a wide
13 variety of information exchange functions in a simple,
14 standardized and economical manner.

15

16 **API Functions: 1) Product Setup**

17 In preferred embodiments, API 40 and API 42 include a
18 product setup routine of an application-specific
19 configuration, which is used by the publisher or product
20 developer, prior to publication, to establish seamless
21 compatibility between the containing information product 12
22 and the information transport component 14 for smooth
23 execution of desired transport functions. A completion
24 status code is also specified.

25

26 The application-specific configuration posts user and

1 product ID information, as needed to process password or
2 other access code authentication and posts files
3 information, including designation of an application work
4 directory and a transporter work directory for performing
5 the transporter functions of information transport component
6 14.

7
8 Additionally, the application-specific configuration sets up
9 an appropriate decompression (or compression for send
10 objects) technique according to the expected format and
11 condition of fetched information objects 46, which
12 information is pre-coded into communications component 36.

13
14 The application-specific configuration established through
15 API 40 selects either a standard user interface, as
16 furnished with information transport component 14, or an
17 application-controlled user interface. Control settings are
18 established for connection problem handling, disk error
19 handling, abort and server condition handling, access
20 denial, unavailability of information object files and any
21 other error situations which may occur during transport.

22
23 If desired, optional, advanced controls for scheduled
24 automatic calling can be included in the application-
25 specific configuration used in preparing the containing
26 information product 12 for publication.

1 Preparation of containing information product 12 and
2 incorporation of information transport component 14 therein,
3 with an application specific configuration, as described is
4 carried out prior to publication to build a customized,
5 ready to run version of the product with automated update
6 capability.

7
8 Communications API 42 establishes a product-specific
9 transport method choice list for selection of an appropriate
10 file transfer protocol as between direct dial, data network
11 dial, and other modes of transport. Communications
12 protocols specify necessary connection parameters such as
13 access number and network addressing or other routing
14 information. Optional script choices can provide for
15 different modes of transport.

16
17 These product-specific configurations and protocols enable
18 information transport component 14 to be packaged in
19 executable form with containing information product 12, with
20 all necessary product-specific components and settings,
21 including a standard user interface if selected, ready for
22 inclusion in the product package.

23
24 If desired, at the option of the information product
25 publisher, a standard user interface may be included. Such
26 an optional standard user interface can have all facilities

1 needed to select transportable objects from a predefined
2 list, perform all user setup functions, and invoke
3 information object transport.

4

5 Additional options are standard software that would allow
6 the user to search, view and print the transported objects
7 totally independently of the user interface and database
8 search components of the containing product. Both such
9 options enable a publisher to exploit the inventive
10 transport product for efficiently and economically providing
11 updates without having to make changes to the publisher's
12 containing product, simply by configuring the transporter or
13 information transport component 14 and physically including
14 it, and the optional components, within the containing
15 product.

16

17 A standard viewer might handle only ASCII text, but it
18 preferably could provide for other useful formats such as
19 standard word processor, spreadsheet or database formats, or
20 multimedia formats such as video, sound and HTML (hypertext
21 markup language), a format becoming popular on the Internet.

22

23 **API Functions:** 2) User Setup

24 Compatibility with the user's system is effected by API 40
25 establishing a user-specific configuration, and creating or
26 updating the necessary control files.

1 Parameters established in the user-specific configuration
2 include a setup ID number to permit use of multiple setups,
3 for example, for different transport options, and a product
4 ID number.

5

6 The user-specific configuration posts user ID information
7 and a password or other access code authentication and posts
8 files information, including disk and drive designation for
9 work and data directories. Autocall options and a
10 completion status code are also specified.

11

12 API 40 provides information for communications module 36,
13 specifying a user communications protocol for the user's
14 hardware, operating system, line configuration, and so on.
15 Thus, for a standard telephone connection, comm port, speed
16 (baud rate), interrupt settings, modem type and control
17 strings, dial prefix, dial 9, pulse or tone, call waiting
18 shut-off, and the like are specified, as appropriate.

19 Additionally, the user communications protocol includes
20 access number and connection parameters, optionally with
21 script selection for routing choices via data networks, and
22 so on.

23

24 The resultant user-specific configuration and communications
25 protocols generated through API 40 create a setup ready to
26 call and places it in the designated transporter work area.

1 A validation procedure checks entries and reports obvious
2 errors in parameter settings.

3

4 Preferably, multiple product ID setups are provided to
5 enable multiple information products to use the transporter
6 with an appropriate, compatible transporter version.

7 Preferably also, the user-specific configuration
8 accommodates shared use of the transporter work areas by
9 multiple information product applications resident on the
10 same user's system.

11

12 Mechanism of fetch-send protocols 38 (user) and 44 (server)

13 User fetch-send protocol 38 working in cooperation with
14 server fetch-send protocol 44 controls the desired
15 information object transport function, calling remote server
16 22 and exchanging data objects. It performs or supervises
17 communications between the user's system and remote server
18 22.

19

20 Communications module 36 uses a setup ID number specified
21 through API 40 or 42, selects which setup to use for a call,
22 calls remote server 22 using protocol 38, and in a preferred
23 embodiment, sends an object manifest comprising a send
24 object list, a fetch object list or both. Such manifest is
25 created under control of user interface 28 from a pre-
26 existing set of choices supplied with the product or

1 obtained during previous update operations, or both.

2

3 Alternatively fetch-send protocol 38 may refer to a pre-
4 existing manifest list stored at the user's station, or may
5 be directed by remote server 22 to select one of multiple
6 pre-existing manifest lists stored at the user's station.

7 As another alternative, although it is convenient and
8 advantageous to transmit the manifest list to the server 22,
9 the relevant status and management information can simply be
10 used locally by communications module 36 and be integrated
11 into the individual fetch and send protocols.

12
13 A send object list comprises object action codes specifying
14 the type of server action required, if any, object names,
15 object sizes and response object size, if any. A fetch
16 object list comprises object names, object sizes and an
17 object availability date.

18
19 A completed object manifest is employed to convey the status
20 of the transport operation and to provide for additional
21 information transport, if desired. The completed object
22 manifest adds the following to the request object manifest:
23 send object additional information; object acceptance codes
24 returned by server 22; time of acceptance; and a response
25 object name, if called for by the object action code.

26

1 For a fetch operation, the completed object manifest adds
2 the following to the request object manifest: fetch object
3 additional information; a fetch confirmation or failure
4 code; the time of completion or failure and a revised
5 availability date if the requested fetch object was
6 unavailable.

7
8 If a scheduled update or polling option is present and
9 selected, a scheduling or polling indicator is included, and
10 a completion of processing or import function to call
11 through API 42 is specified.

12
13 A completion status code terminates the fetch or send
14 operation and returns control to the information product
15 application or the provided user interface.

16
17 Information transport using communications module 36

18 Communications module 36 employing the described fetch-send
19 mechanism comprised by cooperating protocols 38 and 44
20 performs the functions necessary to complete an information
21 transport operation, as described herein, under a variety of
22 circumstances, with tolerance for a common range of error
23 conditions, open drives, inadequate disk space, lost line
24 connections and the like, without losing control of the
25 user's system. Using correct, verified ID, naming and
26 routing information, the information transport operation

1 employing the inventive information transport component 14
2 is less error-prone than many computer users would be were
3 they effecting the transport operation with conventional
4 technology requiring them to enter routing and storage
5 information and the like, manually.

6

7 Communications module 36 verifies that all send objects are
8 as specified, that all fetch objects are scheduled to be
9 available, verifies that sufficient disk space is available
10 for all fetch objects and for compressed transmission copies
11 of all objects, and returns an error report if any of these
12 requirements is not fulfilled.

13

14 Communications module 36 performs communications, then
15 returns a completed object manifest, and logs all activity
16 in a transporter log file. If an optional
17 scheduling/polling feature is selected, the communication is
18 deferred until the scheduled time.

19

20 These general objectives are achieved by carrying out the
21 following process steps after an application (or optionally
22 a transporter user interface) requests a transport function:

23

- 1) Local validation of the request returning a
failure code if the request is improperly
specified.

25

26

- 2) Compression of all send objects for transmission

and placing them in the designated transporter work area.

- 3) Connection attempts to remote server 22, returning a failure code if necessary. Connections are made via phone line or network. The system handshakes and identifies the call to the server.
- 4) Presentation of the object manifest, if utilized, for validation and action.
- 5) On receiving a go-ahead, transport of each send object, logging each as sent, and receipt of object acceptance codes from the server and logs them, when received.
- 6) Receipt of all fetch objects from the server, placing them in the transporter work area, and logs them as received. Fetch object names may be precise, or generic or alias names may be used to request a latest installment.
- 7) Receipt and logging of a completed object manifest from the server. (If receipt of response objects is implied by the action codes, first receives a revised object manifest, and fetches the response objects, then receives the completed object manifest.)
- 8) Disconnection from server.
- 9) Decompression and unpacking of all fetch objects into application work area, and logs completion

1 status.

2 10) Returns control to the application (or optional
3 transporter user interface).
4

5 The product checks the completion code, and completed object
6 manifest to deal with any error conditions. The application
7 performs any required import processing on fetched objects
8 to integrate the data and indexes with prior data, as
9 desired, to enable seamless use. If desired, import
10 processing can include, or offer as a user selection, file
11 maintenance functions relevant to the information product
12 including, for example, file purging to remove obsolete
13 information files and preserve the user's storage space.
14 Specifications of files to be deleted can be included with
15 the original product or with a fetch object. In either
16 event the responsibility for accurate specification is
17 passed to the vendor, relieving the user of the risk of
18 making erroneous deletions and anxiety attendant thereon.
19 After such import processing the containing information
20 product (or the optional separate user interface) then
21 returns control to the user for use of the received data.

22
23 The foregoing steps are illustrated in the flow block
24 diagram of Figure 2. When containing information product 12
25 issues an information transport call 50, setup filter 52
26 runs setup routine 54 if this is a first call and no

1 information transport setup was run on installation of
2 containing information product 12. At block 56, an object
3 manifest is retrieved for pre-transport preparation at block
4 58. After prepping, a call to server 22 is established at
5 block 60 and when the connection is made, and a handshake
6 performed, one or more objects is transported at block 62.

7

8 After completion of transport and receipt of a completion
9 manifest, server 22 is disconnected at block 64, received
10 objects are decompressed and unpacked at block 66 and stored
11 in a designated disk storage location at block 68. Object
12 storage triggers containing information product 12's import
13 processing to assimilate the information update with the
14 original information product at block 70, following which a
15 completion report is issued at 72 and control is returned to
16 the containing information product 12 at 74.

17

18 Optional schedule function

19 An optional transport function module for scheduled or poll-
20 responsive information object transport can be provided to
21 defer the fetching of an update or to defer another
22 information transport operation to a specified later time,
23 or until called by the server.

24

25 The optional transport function schedules a request, waits,
26 then automatically performs the transport operation at the

1 scheduled time. In polling mode, it activates (and, if
2 necessary, interrupts and then reactivates) the user
3 station's ability to receive calls.

4

5 Mechanics of the optional transport function include a
6 request for an ID number, an indicator for calling or
7 polling mode and a schedule iterating a call time, a retry
8 protocol, call activation and timing, along with an
9 authentication procedure for the server and a completion
10 status code.

11

12 Client-Server communications protocol

13 Communications between the information transport component
14 14, functioning as a client, and the server 22 follow a
15 predefined communications procedure having cooperative user
16 components comprising user fetch-send protocol 38 and server
17 fetch-send protocol 44.

18

19 Server-client intercommunication can be broken down into
20 five steps, a) login, b) manifest transmission, c) send
21 operation, d) fetch operation and e) logout, as described in
22 more detail below.

23

24 a) login

25 Login establishes a session with an authorized client. A
26 handshake process between user protocol 38 and server

1 protocol 44 identifies the user's transporter client system
2 to remote server 22 by product ID and user ID, and a
3 password or other authentication code. A failure reason
4 code is given to rejected clients.

5
6 **b) manifest transmission**

7 Preferably, via user protocol 38, the user system issues an
8 information object transport request manifest to server 22.
9 Server 22 verifies its ability to meet the request by
10 returning a manifest acknowledgment specifying which
11 elements will be processed and provides reason codes for
12 declined elements. Alternatively, as stated previously,
13 manifest functions can be listed in individual send and
14 fetch protocols.

15
16 **c) send operation**

17 If the user system outputs a send object, through
18 information transport component 14 and protocol 38, server
19 22 receives and accepts the send objects and stores them,
20 identified by product ID and user ID. Error control and
21 retry mechanisms are employed and successful receipt of the
22 send object is acknowledged and logged.

23
24 If the action code calls for a response object, the server
25 obtains necessary processing from a pre-designated external
26 source (corresponding to the product ID and action code) and

1 returns the response as a fetch object, called a response
2 object.

3

4 **d) fetch operation**

5 The server obtains requested fetch objects by product ID and
6 object name and forwards them to the transporter at the
7 user. Error control and retry mechanisms are employed and
8 successful transmissions are acknowledged and logged.

9

10 **e) logout**

11 The server transmits the completed object manifest to the
12 transporter, confirms and logs receipt, and ends the
13 session.

14

15 **The inventive transporter compared with a conventional**
16 **communications product**

17 **Figures 5 and 6 illustrate schematically the simplicity and**
18 **ease-of-use benefits the invention provides Figure 6 to a**
19 **user 100 in fetching an information object from a remote**
20 **server 22 as compared with the use of a conventional**
21 **communications product (Figure 5), such, for example, as**
22 **CENTRAL POINT COMMUTE (trademark) or PROCOM (trademark).**

23

24
25 In the prior art embodiment of Figure 5, many operations
26 require active participation by the user who, for example,
27 must at least initiate any pre-transport preparation 104 of
28 the information object, such as checking the specifications,

1 checking work space available to store a fetched object and
2 conducting any other preliminary checks. The user has to
3 activate a communications product 102, specify a call route,
4 and after the call connection is established, specify the
5 objects and initiate a transport operation. Communications
6 product 102, operating in a cooperative manner with remote
7 server 22, will execute establish call connection 60 after
8 the call route (phone number) has been specified and will
9 execute transport objects 62 after the objects to be
10 transported are specified by the user. Disconnection 64 is
11 usually effected by a user executing a call termination
12 command, which if the user is inattentive, or inefficient,
13 may be delayed longer than necessary to complete the
14 transport operation, running up unnecessary line or air time
15 charges.

16
17 After completion of the transport operations, user 100 has
18 to deactivate the communications product 102 and then
19 initiate any required storing and processing of the fetched
20 product 106. While some of these steps may be automated via
21 one or more batch files, scripts or macros, a vendor of a
22 containing information product 12 has great difficulty in
23 furnishing such a batch file or macro for a mass market
24 distribution because of the different systems and
25 communications products encountered in a mass market, which
26 systems and products have a variety of different

52

1 specifications, performance characteristics and unique,
2 incompatible scripting languages.

3

4 Equally, while some more skilled users 100 might be able to
5 write their own batch files without undue difficulty to
6 automate some of these steps. Many users will lack the
7 ability or the inclination to do so. Also the effort would
8 not be justified for a single transport operation. Nor is
9 the result of such efforts likely to match the ease and
10 simplicity of the results achieved by the present invention
11 which enables even a first update to be obtained
12 effortlessly with the software running in unattended mode,
13 after initiation.

14

15 **Figure 6** clearly shows how the inventive information
16 transport component 14 relieves user 100 of many tedious
17 communication functions such as activating a communications
18 product, specifying a call route, specifying the objects to
19 be transported and deactivating the communications product.
20 In addition, preferred embodiments of the invention also
21 relieve the user of optional pre-transport preparation 104
22 and execution of store-and-process-fetched-product 106 if
23 these functions are appropriate to the containing
24 information product.

25

26 Referring to **Figure 6**, user 100 selects a transport

1 operation from a user interface screen in containing
2 information product 12, whereupon the latter calls
3 information transport component 14 to activate transport.
4 Information transport component 14 implements any necessary
5 pre-transport preparation 104 and then, employing its own
6 communications module 36, and server fetch-send protocol 44,
7 proceeds in unattended mode, without requiring user
8 intervention to establish call connection 60, to execute
9 transport object 62 and automatically perform a disconnect
10 64, as described herein.

11
12 Automatic transport control and disconnection is a useful
13 feature of the invention providing economy of line or air
14 time charges and reducing congestion on the communications
15 carrier. Using conventional communications products,
16 (especially with online services) the duration of the
17 connection may be unnecessarily extended by the delays and
18 potential errors inherent in user control, resulting in
19 increased communications costs and failures. The inventive
20 transporter 14 provides software control of the connection
21 duration, enabling it to be confined to a period sufficient
22 to effect said unattended object transfer, enhancing
23 efficient use of the communications medium.

24
25 Also as described, the operation can be monitored or
26 controlled by employing an object manifest and is

1 facilitated by the use of pre-specified addresses and
2 transport characteristics. After satisfactorily completing
3 the transport, the information transport component 14
4 automatically deactivates and returns control to containing
5 information product 12, preferably with a satisfactory
6 completion report which containing information product 12
7 notifies to user 100 through the containing information
8 product 125 user interface.

9

10 If the transport object 62 was a product update, optionally
11 a store-and-process-of-fetched-object 106 is initiated by
12 information transport component 14 and execution of the
13 store and process operation may be passed to the containing
14 information product 12. The user can now use the updated
15 product.

16

17 As Figure 6 shows, when read, in comparison with Figure 5,
18 the invention enables a user 100 to be relieved of all
19 duties save for minimal selection and notification
20 functions, while no complex added functionality is demanded
21 of containing information product 12. Optional store-and-
22 process-or-fetched-object 106 is contemplated as requiring
23 only minimal modification of existing containing information
24 product 12 functions while other more complex procedural and
25 detailed transport related functions are handled by the
26 information transport component 14.

1 Some non-limiting examples illustrative of practical
2 commercial and industrial applications of the invention will
3 now be described.

4

5 **Example 1: A News Magazine Distributed on CD-ROM**

6 Some weekly news magazines offer subscriptions to a
7 quarterly CD-ROM which contains multimedia material plus a
8 searchable full- text database of the most recent quarter's
9 weekly magazine issues and enabling application software.

10 Newer issues are not provided until the next quarterly disc
11 is mailed. Accordingly the CD-ROM electronic magazine
12 product steadily becomes out of date and its value lessens.

13

14 The invention incorporates an information transport
15 component 14 with a news magazine product stored on a CD-ROM
16 16, to enable a user to fetch an information object 46 in
17 the form of new issues (and their associated search indexes)
18 from a remote server 22, as they become available, for
19 example weekly. The fetched updates are stored on a
20 consumer's computer hard disk storage device 24. Because of
21 the size of rich content multimedia files, the updates are
22 limited to text material including full texts of interim
23 issues and associated files such as indexes. Because it
24 knows the storage location of the updates, the next CD-ROM
25 issue can include, as an install option, or upon first
26 access, a request to delete the old now-outdated updates

1 from hard disk 24, creating space for new updates.

2

3 User interface 28 in conjunction with user interface 34
4 contains code providing a menu selection enabling a user to
5 activate the update fetch operation and then to provide
6 integrated or seamless access to the combined data,
7 searching both the hard disk storage device 24 and the CD,
8 using both sets of indexes, so that the contents are
9 viewable as a single collection, although an additional
10 independent searching/viewing function for the updates could
11 be provided, if desired.

12

13 A product setup routine adapts the information transport
14 component 14 to work with the news magazine CD-ROM's
15 existing software for creation of a user interface,
16 searching and viewing. Communications options may be
17 limited to direct telephone dial only. A simple user
18 interface addition controls a setup process allowing the
19 user to enter a unique user ID, provided with each copy of
20 the CD-ROM distribution disk, and to create predetermined
21 work areas on the user's hard disk.

22

23 A schedule of updates with names, dates, and files sizes is
24 provided in the containing news magazine product on the CD-
25 ROM and is accessed via user interface 28 in conjunction
26 with user interface 34 to create a fetch object manifest 48.

1 Optionally, user interface 28 in conjunction with user
2 interface 34 creates a send object manifest 48 to control
3 transport of user demographics for market analysis or for
4 renewals, or the like, in the opposite direction from the
5 user to the server, with the send operation being triggered
6 whenever the next transport operation is activated, or
7 optionally, ~~by allowing~~ by allowing the user to trigger it.

8
9 A fetched information object 46, such as an update, is
10 automatically decompressed and stored on hard disk storage
11 device 18 as additional information object 26 for
12 integration with the original CD-ROM product so that the
13 user can view both the update and the original issues, and
14 run searches across the entire collection.

15
16 Optionally, initial location of additional information
17 object 26 may be an application work area location on
18 storage device 18, and communications component 36 may be
19 pre-set to pass control via API 42 to database management
20 module 30 which will do further processing to integrate
21 additional objects in accordance with the existing database
22 structure 32 to provide a more complete level of integration
23 permitting, for example, viewing of combined menus,
24 nullification of obsoleted items, and cross-linking of
25 hypertext elements.

26

1 If a send object has been prepared and included in the
2 object manifest, such as a send object containing user
3 information entered during the install process, or
4 subscription request information obtained from the user, it
5 is sent to server 22 to be stored and identified by product
6 and user ID for appropriate action in due course.

7 Acknowledgement of receipt of the send object is noted by
8 communications component 36 and passed back to the user if
9 such provision is made in user interface 28.

10

11 Both the fetch and send operations are closed ended in the
12 sense of being operations that are pre-described in the
13 original information product and once triggered, can be
14 completed without human intervention of any kind.

15

16 To service the automated update facility running at the
17 user's workstation, remote server 22 is set up to accept
18 calls from valid user ID's, and is loaded with new issue
19 text and index files, in the form of update information
20 object 46, according to a publication schedule.

21

22 **Example 2: Open-ended Fetch of a Supplementary News**
23 **Magazine Object**

24 Open-ended access to supplemental information objects not
25 described in the original information product can be
26 obtained by providing in the original product means to fetch
27 a directory of added features. This can be used, for

1 example, by a news magazine publisher to provide special
2 news features on an unplanned basis, or each weekly issue
3 could be packaged with a directory of additional features
4 available. The user first specifies a fetch of the new
5 directory, or receives it along with a fetched update they
6 have specified from a user interface menu, and then views
7 the fetched additional features directory and initiates a
8 fetch of a selected additional item or items in a second
9 information object transport operation, using an information
10 object manifest built from the new features directory.

11
12 The original, containing product news magazine CD-ROM user
13 interface 28 preferably has provision for importing and
14 viewing any information objects listed on a completed fetch
15 manifest and delivered by the information transport
16 component 14 into the designated work areas. Alternatively,
17 a standard information transport component 14 user interface
18 34 can be used to provide this function in a less integrated
19 form.
20

21 **Example 3: Retail Catalog on CD-ROM with Merchandise**
22 **Order Entry at the Server**

23 Multimedia product catalogs with 800 ordering numbers are
24 now available on CD-ROM and also with pre-installed software
25 packages on new computer hard disks. In this example, the
26 multimedia (or text and graphic) product catalog is a read-
27 only information product 17 which can be furnished with an

1 information transport component 14 according to the
2 invention, to facilitate order placement from such
3 electronic product catalogs providing an easier order
4 placing process than has heretofore been possible.
5 Employing the inventive information transport component 14,
6 a catalog vendor can enable a customer to place the order
7 directly, via modem, without requiring a voice call and
8 ensuing verbal product identification, by pointing and
9 clicking a "Place Order" or "Mark for Order" button on the
10 user's computer screen. The order is transported to remote
11 server 22 using the novel information transport component
12 14. Preferably a verification routine is included,
13 requiring order confirmation with a user-supplied password,
14 and possibly keying of the total amount to prevent
15 unauthorized or inadvertent product ordering, for example by
16 children.

17
18 Order fulfillment is effected by processing of the
19 information in due course after receipt by the remote server
20 22 and any additional information required centrally is
21 collected during product setup and held locally for
22 transmission with an order. For example, setup can capture
23 the user's charge card information, shipping address, and
24 the like and create a header for an electronic order form.

25
26 When the user clicks the "Mark Order" button, procedures

1 supplied with the user interface 28, as modified through
2 user interface API 40, add order item identification
3 information to an electronic order form. When the user
4 clicks the "Place Order" button, user interface 28 triggers
5 a transport request to server 22, to include the order form
6 as a send information object 46. Transport of the send
7 object, including the order form, from the user's station to
8 the server is executed employing an object manifest 48, as
9 described herein.

10

11 If not located at a vendor's or merchant's premises, server
12 22 can forward received electronic orders to the merchant
13 for fulfillment, at appropriate intervals, via a vendor link
14 50.

15

16 This simple, low cost mechanism for automated order
17 placement, can complement telephone ordering but lacks the
18 credit-checking and inventory status capabilities that are
19 frequently provided by phone. However, such a catalog
20 application could allow the user to request the fetching of
21 an inventory and price update object for use prior to the
22 preparation of an order.

23

24 **Example 4: Merchandise Order Processing and Confirmation**
25 **Retail Catalog on CD-ROM**

26 A powerful electronic merchandising tool can be provided by
27 providing the user with a full-function order generating

1 capability and employing transporter 14 to transmit a user -
2 created merchandise order, effortlessly and seamlessly, to a
3 remote order-processing server. To this end, server 22
4 should be interfaced to the necessary merchant processing
5 services for checking and reporting credit and inventory
6 status.

7

8 An additional valuable option enables the system to apply
9 pre-specified user instructions, previously obtained through
10 user interface 28, to determine whether out-of-stock items
11 are to be dropped, back-ordered, or substituted in color or
12 other aspect. This information can be added to the
13 electronic order form object, listed in object manifest 48
14 and become the subject of a further transport dialog between
15 the user's station and server 22. In this manner a
16 sophisticated purchase transaction is completed in a
17 substantially unattended manner (save for deciding about
18 back orders off-line), in as much as the customer does not
19 have to maintain a phone conversation, while fully achieving
20 the capabilities of telephone order placement. A further
21 user benefit can be obtained by the providing a permanent
22 record of the transaction (a stored electronic file) without
23 user intervention. This not possible with telephone
24 ordering.

25

26 This novel, automated, modem driven, order placement system

effectively shields a merchant from having to deal with the problems of establishing communications with a mass of unknown end user computer systems, while automating the process and relieving the merchant of the costs of telephone sales staff. This aspect of the invention is valuable in avoiding troublesome, support intensive, communications which are subject to rapid technical change as new products are absorbed into the marketplace. In contrast, the merchant's special purpose vendor link 50 to the server 22, can remain relatively stable, while the customer interface at server 22, depending upon the sophistication and universality of the API's 40 and 42, and also upon any emergent communications standards, can be adapted to accommodate a range of future products.

Example 5: Further Applications of the Invention:
Locked information products

As discussed in the "BACKGROUND OF THE INVENTION" hereinabove, some vendors, for example Microsoft Corporation, distribute information products in locked, inaccessible form, accompanied by (user-accessible) promotional information and demo versions. The prospective purchaser then calls an 800 number to order the product and is given a code which is entered to unlock the item for use. The inventive information transport component 14 and cooperative server component 22, can be used to simplify this process, and eliminate the voice call.

1 The information transport component 14 is used to place the
2 order and as a subsequent step concomitant with satisfaction
3 of the merchants purchase requirements (payment, etc) can,
4 employing a suitable line entry or entries in the object
5 manifest 48, fetch the access code, as an information object
6 46, in the same way as an order acknowledgment or other
7 information update. The user interface and data management
8 components of the distribution CD, or original information
9 product, can be programmed automatically to use the code to
10 unlock the product.

11
12 Employing the novel, digital, modem-enabled communications
13 products of the invention, more sophisticated access codes
14 than are suitable for verbalizing to a caller, can be used,
15 and may include small programs or decompression utilities
16 (although these would better be stored in the locked
17 product), or customer-specific coding employing user-derived
18 information. Thus, as a safeguard against fraud, being
19 equipped with specific user or user product information, the
20 access code can be a key or product uniquely matched to the
21 user's locked product copy.

22
23 **Computer Software Updates:** For distribution of updates to
24 software products, the original distribution version of the
25 software product can provide registered users with an
26 appropriate ID code and update schedule. Should the

1 revision be delayed, a revised schedule can be fetched.

2

3 **Tax or other governmental filings and exchanges:** An example
4 of the generality of the inventive information transport
5 system for sending and fetching well-defined information
6 objects of many kinds is in the filing of tax returns. A
7 send information object can be created and manifested to
8 submit electronic tax filings to the IRS, as described
9 above, for electronic product order forms. A fetch object
10 can be created to obtain updated tax forms and the program
11 logic relating to them, and to get information on new
12 regulations. Analogous uses will be apparent to those
13 skilled in the relevant arts of, for example, financial
14 planning and portfolio management systems, to obtain current
15 statistics, place orders, and the like.

16
17 **Packaging of Transporter with User Interface/Database Search**
18 **Software Facilities**

19 In a modified embodiment, the inventive information
20 transport component 14 is integrated with a general purpose
21 user interface/database search (UI/DB) software package and
22 tools. Such packages and tools, sometimes referred to as
23 "authoring packages", are now used to produce CD-ROM's and
24 similar information products. Thus a single UI/DB product
25 may contain the inventive information transport component
26 14, and be supplied to publishers to be used to develop a
27 family or diversity of information products, as a standard

66

1 tool box.

2

3 A combination of the inventive information transporter
4 product with such UI/DB products could facilitate
5 development of applications by allowing much of the work of
6 integrating a containing product's user interface 28 and
7 database functions 30 and 32 (which could be controlled
8 through the UI/DB product) with the inventive information
9 transport component 14 to be performed once, in advance, by
10 a UI/DB software vendor's skilled specialists, for use in a
11 diverse range of products using that vendor's software.
12 Such integrated offering would be advantageous to both the
13 software vendor (by enriching its offering) and to the
14 software vendor's publisher-customers by facilitating the
15 desired function.

16

17 Electronic product distribution service

18 In a valuable application of the novel electronic
19 information transport products of the invention, remote
20 server 22 can be operated to provide an electronic data
21 product distribution service for multiple containing
22 information products 12, each equipped with an information
23 transport component 14, the whole facility providing a
24 complete network distribution service, including network,
25 technical and end-user support. Provision of such a
26 distribution service is greatly facilitated by the novel

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For many publishers (and for providers of UI/DB authoring software) the task of operating a publicly available server 22, and of supplying associated technical support to a wide base of customers using a diversity of communications products, even with the simplification benefits provided by the inventive transport product, is a task requiring specialized skills and staffing that a publisher, even one experienced in electronic publishing, will generally lack. Such a specialist capability is intimidating to provide and difficult to cost-justify for the limited number of information products that one publisher can supply.

1 By providing a new turnkey service or service bureau a
2 specializing, skilled vendor would enable the publisher to
3 avoid such burden. A provider of such a novel service can
4 spread the costs of such operational activities and skilled
5 staff across a large number of publishers and information
6 products, achieving economies of scale and specialization.

7
8 The inventive information transport products extend to
9 software implemented at server 22, or at one or more clients
10 or satellite servers, of a network served by server 22, to
11 provide the server-location functions of such an electronic
12 product distribution service. Such distribution software
13 can be separately marketed to publishers or UI/DB vendors
14 who wish to operate such a service.

15
16 Gatewayed, "open" server

17 Example 4, above, shows how information transporter 14, as
18 well as server 22 can remain simple yet provide a highly
19 general and extensible service. In that example, server 22
20 provides the functionality of a general-purpose transaction
21 gateway or interface to an external function processor. In
22 this particular case, the external function processor
23 gatewayed by server 22 via vendor link 50, is the merchant's
24 order processing system, which receives the order,
25 determines its disposition, and responds with order status
26 information which is relayed back to server 22 for return to

1 the customer as a response object in accord with protocols
2 38 and 44. The user need not be aware of such complexities,
3 nor do the client transport components 14 of the inventive
4 product need to be aware of, or provide information for
5 remote routing via vendor link 50. Only the server 22 needs
6 this information, and server 22 needs only to know that send
7 objects with names that fall within a specified class for a
8 specified product ID, must be forwarded to a specified
9 external processor, and that the corresponding responses
10 from that processor must be routed back to an originating
11 client as response objects. Thus the inventive information
12 transport component 14, by virtue of its simplicity has
13 general applicability and many uses, as described herein and
14 as will further be apparent to those skilled in the art.

15
16 In implementing an ordering service using the inventive
17 information transport component 14, order and response
18 objects are preferably formatted by the containing
19 information product 12 to be consistent with existing or
20 future electronic data interchange (EDI) standards which
21 define protocols and formats for data interchange between
22 customers and vendors. The information transport component
23 14 and the server protocol 44 provide the low-level EDI
24 transport functions and are independent of object content
25 defined by higher layers of the EDI protocol. Preferably,
26 the server has added routing layer information to move

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1 objects to and from the external processor.

2

3 To provide a suitable EDI-compatible function, server 22 can
4 be programmed with such higher layer EDI routing data for
5 its exchanges with the merchant's external processor.

6 Employing such a gatewayed system, a single EDI network
7 connection can be used to connect the server 22 to a large
8 number of different merchant processors anywhere in the
9 world, across wide area networks and links between same, for
10 example Internet.

11

12 This concept of an "open" server, providing a gatewayed
13 pathway for information objects to travel between a wide
14 base of users and one or more remote vendors or other object
15 sources is greatly facilitated, or enabled, by employment of
16 the inventive transporter 14 which effectively provides a
17 protocol translation function enabling a simple information
18 transport service to be offered which is easy and economical
19 to use, both for the end user and the vendor or information
20 supplier. Such a transport service compares favorably, for
21 its intended information transport purposes with broader
22 function and more complex of full online services, such as
23 COMPUSERVE (trademark), and the like, described hereinabove.

24

25 **Further embodiments with broadcast, subscription delivery**
26 **and on-demand capabilities**

27

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1 **Receipt of broadcast data:** As an alternative to modem-based
2 wireline or wireless calling to a server and requesting data
3 objects, the information transporter system of this
4 invention can be beneficially employed in a broadcast
5 information distribution system wherein data information
6 objects are contained within a broadcast data stream with
7 recipient communications devices tuned to identify and
8 receive from the broadcast specific data elements to which
9 they are entitled.

10 Broadcasting can be airwave broadcasting via satellite, FM,
11 or TV subchannels in the manner, for example, used by
12 Mainstream Data Ltd. for the broadcast of news wires.
13 Alternatively, the broadcast data stream may be cable or
14 line transmitted, for example, over cable television
15 systems. Minor extensions to API's 40 and 42 could
16 accommodate such a facility. A modified setup function
17 could alert a user's receiving communications device to
18 watch for receipt of data objects identified as relating to
19 the original or containing information product, and to
20 capture and hold identified objects in temporary storage. A
21 schedule transport function can then be set to fetch the
22 received data objects from temporary storage and prepare
23 them for use.
24
25

26 **Subscription delivery:** Although the invention has been

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1 described as being particularly applicable to the solution
2 of problems arising in distributing updates of original or
3 previously purchased or delivered electronic information
4 products, those skilled in the art will appreciate that
5 many of the benefits of the invention can be obtained
6 without any initial information content being delivered to
7 the user with the original product. The user could simply
8 receive the information transporter 14 and all product
9 information could be received subsequently, after installing
10 the information transporter 14, in the form of fetch objects
11 transmitted from a remote server or other suitable source.
12 For example, a newsletter service could provide a disk with
13 the transporter and a user interface, but with no initial
14 information content.

15
16 **Information-on-demand services:** In another embodiment,
17 providing an information product on demand service, vendors
18 can freely distribute a novel electronic marketing product
19 comprising a transporter on diskette, along with a simple
20 user interface and a catalog of information product items
21 available from the vendor, without including the products
22 themselves. Such an electronic marketing product could be
23 distributed through the mail, as a magazine insert giveaway,
24 ^{or} ~~on~~ through any other suitable marketing medium. The
25 transporter could be activated at any time by the user to
26 call in and fetch a cataloged product, as well as a current

1 catalog, possibly after sending a credit card order form, or
2 the product price could be paid to the vendor by obtaining
3 the product from a 900 number providing vendor reimbursement
4 from the telephone network.

5

6 Open architecture online service access

7 In a further aspect, the invention provides an information
8 transport component 14 that functions as universal or
9 generic client interface software, enabling a user client to
10 work with any one or more of many online server-based
11 information distribution services.

12

13 Many online information distribution services used to
14 disseminate electronic publications comprise intelligent
15 user interfaces which employ a client component running on a
16 customer's personal computer (PC) to communicate with a
17 central server facility operated by the online service, by
18 means of a proprietary protocol. The client interface
19 packages are proprietary to a particular online service.

20

21 Prospective publishers wishing to offer electronic products
22 online, contract with online service providers to enable
23 customers to use the online service's client software to
24 access the publisher's material and related online
25 communications services (bulletin boards, etc.) on the
26 services' servers. The publisher is limited to using the

1 presentation facilities provided by the user interface in
2 the online service's client software. This limitation
3 impedes migration of publisher offerings and makes it
4 difficult for either a customer or a publisher to swing
5 information transport component 14 access from one service
6 provider to another because each service requires its own
7 software package.

8
9 Third party interface developers cannot contribute to such
10 online interfaces for a publisher without the cooperation of
11 the online service provider which may be difficult or
12 impossible to obtain. Accordingly, only limited user
13 interfaces with moderate sophistication and variety can be
14 offered.

15
16 Accordingly in another aspect, to provide open architecture
17 online service communication, the inventive information
18 transport component 14 can be embodied as a flexible client
19 interface which can be actuated to operate with any one of a
20 number of online services by providing a generic client
21 interface foundation API (application program interface)
22 combined with a set of translators and protocol drivers
23 capable of communicating the user's functional requests to
24 any one of a set of online services, using their
25 corresponding proprietary protocols.

26

1 In this aspect the invention permits publishers to develop
2 highly sophisticated and individualized user interfaces
3 independently of the limitations of the online service
4 providers' capabilities. Such enhanced user interfaces are
5 attractive to publishers seeking differentiation of their
6 products by providing an appealing individualized interface
7 with a signature look and feel. In contrast, online service
8 providers seeking to economically carry content from many
9 publishers provide generic interfaces acceptable to all.

10
11 By incorporating operational translators for a number of
12 online service protocols, which translators fully adhere to
13 the detailed specifications of each protocol, a multi-
14 service capability can be provided.

15
16 Online services generally provide similar types of services
17 with nearly standard functions and similar user interfaces.
18 Major service types include bulletin board, chat, electronic
19 mail, document browsing, and database search. Use of
20 creative typography, layout, graphics, and other artistic
21 elements to offer the presentation quality and variety
22 typical of print media is desired by publishers using this
23 medium.

24
25 The invention facilitates this end by providing open
26 development platforms for development of advanced interfaces

1 while shielding developers from the complex details of
2 communication with an online server. The shielding is
3 accomplished by providing an API which supports
4 communications service requests at a simple functional
5 request level.

6
7 Referring to Figure 3, multiple targeted online services 80,
8 can be accessed by a client interface 82 comprising any of
9 multiple graphical user interfaces 84 driving a generic API
10 86 which works with plug-in translator/communicator modules
11 88 which are provided to communicate one to each targeted
12 online service 80. Modules 88 mimic the online service's
13 protocols, so as to be essentially indistinguishable from
14 the proprietary interfaces normally used. A communications
15 manager 90 receives input from API 86 and outputs through
16 protocol mapper 92 which selects the appropriate protocol.

17
18 In this embodiment, for use with full-function online
19 services, the functions of API 86 and protocol 88 are
20 extended to support extended, open-ended interactive
21 sessions and the more varied client-server interaction needs
22 of session-oriented interactive online applications such as
23 bulletin board posting and browsing, online chat, electronic
24 mail, database and menu browsing, and database search.

25
26 Similarly, in the aspect shown in Figure 3, the invention

ff

1 can be provided with the same kind of additional flexibility
2 with regard to the user's connection to server 22 as the
3 invention can provide for more basic fetch and send
4 functions. While the inventive client server protocol 38
5 and 44 is particularly suited to the functions described,
6 other existing or future services and corresponding
7 protocols could be used, if necessary with adaptation, to
8 provide workable services for use in conjunction with
9 transport component 14. Such use may require modification
10 of communications module 36 and protocol 38 by the addition
11 of a protocol mapper 92 and appropriate server protocol
12 plug-in 88 to communicate to an alternative server.

13
14 In either case, such added flexibility in use of the
15 inventive product increases a publisher's choices in
16 selecting server and network facilities through which to
17 distribute information products, and enables the publisher
18 to offer fully customized user interfaces for use with
19 multiple, or any one of multiple server and network services
20 which do not provide for such customization. In this
21 embodiment of the inventive transport component, a
22 containing product can offer a unique custom interface and
23 provide for access to additional information products from
24 such varied source facilities as the Internet, full function
25 online services, emerging groupware network services,
26 conventional bulletin board systems, and future network

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The inventive protocol mapper 92 can insulate a containing information product from the variations among such services, and can allow a single such information product to be transported through a variety of such services, and to later be moved to other such services by simply selecting an alternative protocol mapper. Multiple such protocol mappers can be packaged within a given information product to permit alternatives to be selected by the end-user from a list. Thus the invention further permits information products and related UI/DB authoring tools to be service-independent and neutral.

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1 mounted data sources and storing additional retrieved data
2 locally.

3
4 Enhancements can enable a publisher's service to provide
5 integrated, seamless access to content distributed over
6 several different online services; to seamlessly combine
7 access to both online and local CD-ROM-based content; and to
8 coexist with and share resources with other publishers'
9 services on the user's PC.

10
11 In summary, the invention provides, in this aspect, a
12 simple, easy-to-use multi-protocol capability that enables
13 an electronic information object to be transported from a
14 publisher to a wide base of users by any one of a number of
15 online services, without sacrificing individual product
16 identity.

17
18 Recursive updating of the transporter

19 Another application of the inventive information transport
20 product, or transporter, is a recursive use to update
21 itself, in the same manner that the transporter can update a
22 containing information product. This method can be useful
23 in a variety of ways, including to upgrade the transporter
24 by the addition of new protocol components, new compression
25 techniques, or new network access methods.

26

1 An important class of such self-updates is to provide added
2 flexibility in specifying network access procedures. For
3 example, the user setup routine could be extended into a two
4 stage process. In a first stage, each user's transporter
5 calls in to a common pre-set phone number, in order to fetch
6 a second phone number selected according to the user's
7 particular product, location, or some other parameter. The
8 second phone number, or other address, can then be placed in
9 the setup as an update, to be used in subsequent transport
10 operations.

11
12 This two-stage method can provide efficient use of a single
13 pre-set toll-free 800 number for an initial call from any
14 number of different products, which initial call yields a
15 second number corresponding to a specific Product ID, which
16 number is used for subsequent calls.

17
18 In an advantageous embodiment, the second number is not toll
19 free and may include vendor charges, in the manner of a 900
20 number. This arrangement enables a system in which users do
21 not pay for initial setup calls (and any failed connections
22 which might result from initial setup problems), but do pay
23 long-distance toll charges, and per call vendor fees if the
24 publisher so desires, for subsequent product information
25 transport from the second number. This two-number process
26 can be carried out without requiring any phone number entry


1 or selection by the user. Additionally, the second number
2 can readily be changed whenever desired by the publisher,
3 even after product discs have been shipped.
4

5 User's station

6 References herein to a user's station, workstation, computer
7 or terminal will be understood to embrace any "information
8 appliance" or intelligent device having the basic computer-
9 like functions of programmed logic, storage and
10 presentation, or having the ability to support an operating
11 system for managing user input-output with a processor,
12 including intelligent cable television controllers, video
13 game players, information kiosks, wired and wireless
14 personal communicators, and even system controllers such as
15 automotive computers.
16

17 Benefits provided by the invention

18 Employing the novel information transport component 14
19 interacting with remote server 22 through communications
20 protocols 38 and 44, the invention enables the following
21 advantageous objectives and other benefits to be achieved:

- 22 i) simple and easy execution of one or more fetch or
23 send transactions to or from a remote server, by
24 an ordinary, unskilled user with no human
25 interaction at either end being necessary after
26 initiation;
- 

- 1 ii) automated transport of predefined information
- 2 objects between client and server in a closed-
- 3 ended fashion, without burdening a client-based
- 4 user with complex routing logic; and
- 5 iii) creation of an economic, easy-to-use, function-
- 6 specific, self-contained information transport
- 7 component 14 software module suitable for mass
- 8 distribution in a containing information product.

9

10 The preferred use of an object manifest in a transport

11 control mechanism which includes transporting the object

12 manifest between client user and server, and referencing the

13 object manifest by user fetch-send protocol 38 and server

14 fetch-send protocol 44 facilitates achievement of the

15 following additional objectives:

- 16 iv) simple, tight-knit control of the communication
- 17 process and of error handling; and
- 18 v) creation of a transport control mechanism, and
- 19 thence of an information transport component 14,
- 20 which operates smoothly and transparently to the
- 21 user and independently of the information object
- 22 content or of the nature of the application.

23

24 The invention thus provides an information transport

25 software component which can be employed to transport a wide

26 variety of data objects or applications and can be easily

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1 incorporated in many different information products to
2 provide multiple novel containing information products 12
3 with built-in automated updatability or upgradability
4 executable at an appropriate time by simple, user-menu
5 selection or automatically.

6
7 Further benefits

8 In addition to the benefits of a powerful and efficient
9 information transport method, use of a standard, formalized
10 transporter, its API, and client-server protocol, pursuant
11 to the teachings of the invention disclosed herein, can
12 provide any or all of the following significant benefits to
13 users, information product vendors, application vendors,
14 service providers, tool vendors or others:

15
16 vi) use of a standardized facility to perform a well-
17 defined function in a known way (with available
18 implementations for a varied and expanding set of
19 hardware and software platforms);

20 vii) reliance on a standardized facility that can be
21 extensively tested and proven reliable across a
22 wide variety of equipment and conditions;

23 viii) reduced need for information product developers
24 (and users, and user interface/database search
25 software vendors) to know and understand the
26 complexities (and rapid evolution) of data

1 communications;

2 ix) ability to build a single functional interface
3 that can smoothly employ a dynamically expanding
4 variety of communications facilities and
5 technologies;

6 x) ability to obtain operations and user support
7 services relating to the difficult task of
8 managing a server and its communications with
9 large numbers of end-users;

10 xi) user-recognition of the novel information
11 transport facility across a range of unrelated
12 products, establishing a positive brand cachet
13 benefiting users and vendors alike;

14 xii) ability to package the transporter facility with
15 other tools, such as a UI(user interface) and
16 database search capability to extend the value of
17 those tools economically and with the ability to
18 gain the benefits described above; and

19 xiii) control of communications costs and failures by
20 elimination of human intervention, with its
21 attendant time-consuming delays and errors, from
22 the period during which the user's station is
23 connected in real time communication with remote
24 server 22.

25
26 Stated succinctly, by having the novel information transport

1 component rely entirely on a containing information product
2 for all user interface and information presentation
3 functions, there need be no restrictions on the creativity
4 of the containing product imposed by the needs of a third
5 party communications product. Thus the containing
6 information product can present transport functions with any
7 desired look and feel.

8
9 Another advantage of the information transport system of the
10 invention is the avoidance of difficult or complex
11 navigation tasks, and the use of simple direct dial
12 communications which are suitable for sessions that are
13 short and infrequent. The inventive information transport
14 products described herein are consistent with or readily
15 adaptable to the needs of many publishers of a diversity of
16 materials, which needs are commonly centered on discrete
17 products and content.

18
19 A further advantage of the invention, from the point of view
20 of publishers, is that because the call is customer
21 initiated, the customer pays transport costs (telephone line
22 charges), simplifying costing for the publisher who avoids
23 having to figure shipment or other transportation costs
24 before sale and build these costs into the price of the
25 product or update.

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2

and

1 ~~optionally enhanced with a~~ database management facility for
2 seamless integration of an update with an original product.
3 Other options can integrate with relevant third-party
4 packages such as authoring packages.

5
6 **Level One (Server enhanced)** Adds server operation and user
7 support features enabling publishers to outsource tasks
8 which may be difficult or unfamiliar to them.

9
10 **Level Two** Adds optional translation or use of alternative
11 server protocols enabling an embeddable transporter product
12 to work with many different servers or services including,
13 for example, standard BBS's, Internet servers, and special
14 transport services such as those offered or proposed by
15 communications providers such as AT&T, MCI, Compuserve,
16 America Online and cable television systems.

17
18 **Level Three** Adds a full online service user interface API
19 with correspondingly enhanced client-server protocols to
20 provide for full-function online service sessions with user
21 interface control ^{and with} ability to work with a range of online
22 services, providing a publisher with flexibility in their
23 use of existing and emerging services.

24
25 While an illustrative embodiment of the invention has been
26 described above, it is, of course, understood that various

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Claims

1 Claim 1. A computer-implemented information transport
2 software component separately suppliable for use with any
3 one of multiple electronic information products for mass
4 distribution of electronic information objects to users of a
5 diversity of uncoordinated communications-equipped computer
6 stations by enabling said users to fetch an electronic
7 information object from an object source specified with said
8 information product, in an online fetch operation proceeding
9 in unattended mode after activation, said information
10 transport software component being adaptable to each said
11 multiple information product to have a user interface in
12 said information product for activation of unattended
13 transport of an information object from a remote object
14 source to a user's computer station, said user's station
15 being ^{entered} in real time communication with said remote object
16 source, wherein said information transport component
17 contains a user communications module having user protocols
18 specifying user station functions of said unattended object
19 transport and said remote object source is supplied with a
20 source communications module having source protocols
21 specifying source functions of said information object
22 transport, said user protocols being co-operative with and
23 known to said source protocol to effect said unattended
24 object transport automatically after initiation at said user
25 station.

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1 **Claim 2.** An information transport component according to
2 claim 1 comprising object send means for unattended
3 transport of a send object from said user's station to said
4 remote object source.

1 **Claim 3.** An information transport component according to
2 claim 1 wherein said object send means comprise a user-
3 activatable selection in said user interface, and send
4 specifications in said user and source protocols.

1 **Claim 4.** An information transport component according to
2 claim 1 wherein said user communications protocols specify a
3 remote object source address and wherein object parameters
4 selected from the group consisting of a file name, file
5 names, file size, file location, file content and file
6 format are specified in said communications protocols and
7 said source communications protocols.

1 **Claim 5.** An information transport component according to
2 claim 1 wherein said object specification is listed in an
3 object manifest stored at said user's station.

1 **Claim 6.** An information transport component according to
2 claim 5 wherein said object manifest is sent to said remote
3 object source as a verifier to assist control of said
4 transport operation.

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1 **Claim 7.** An information transport component according to
2 claim 1, comprising a high-level functional interface
3 permitting said information product to remain unaware of and
4 uninvolved in the technical and operational details of the
5 communications process.

1 **Claim 8.** An information transport component according to
2 claim 1, wherein said electronic information product
3 provides user interface and information presentation
4 functions for said information object transport whereby said
5 information product can provide information transport
6 functions with any desired look and feel unconstrained by a
7 communications module.

1 **Claim 9.** An information transport component according to
2 claim 1 wherein said fetched information object is pre-
3 identified and integratable with said information product to
4 which said transport component is customized to provide an
5 augmented information product.

1 **Claim 10.** An information transport component according to
2 claim 9 wherein said information transport component
3 comprises:

4 a) a fetcher module configured to fetch said pre-
5 identified object from said object source
6

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1 employing a pre-specified common carrier address
2 stored in said fetcher module;
3 b) a communications manager to establish and manage
4 connection to said object source under control of
5 said fetcher module and with said assistance of
6 said user and source communications protocols; and
7 c) a fetched object integrator to locate a fetched
8 object in a preset file area accessible to and
9 known to said containing information product;
10 wherein said object pre-identification, said common carrier
11 address and said preset file area specifications are stored
12 in said software component, whereby a workstation user of
13 said information product can automatically effect transport
14 and integration of a pre-identified object from said object
15 source to create an augmented information product at said
16 workstation.

1 **Claim 11.** An information transport component according to
2 claim 1 wherein said information transport component
3 performs a containerized, standard transport operation, said
4 transport operation being transparent to any high-level
5 formatting of said transported information object, and
6 essentially repeatable for a wide variety of different
7 information objects.

1 **Claim 12.** An information transport component according to
2 claim 1 having means to pack or unpack, compress or
3 decompress, and send files to or fetch files from specified
4 locations.

1 **Claim 13.** An information transport component according to
2 claim 1 wherein said transporter allows said containing
3 information product to be set up automatically to effect
4 high-level integration of indexes and navigational
5 structures by letting said containing product have control
6 to import or export or to encrypt or decrypt objects.

1 **Claim 14.** An information transport component according to
2 claim 1 wherein said novel electronic information
3 transporter is seamlessly embedded in said containing
4 product and is separable from said containing product to be
5 usable with other containing products.

1 **Claim 15.** An information transport component according to
2 claim 1 wherein said communications module is self-
3 configuring and includes a workstation surveyor providing
4 workstation configuration parameters.

1 **Claim 16.** An information transport component according to
2 claim 1, wherein said information transport component
3 provides protocol selection means for selecting media for

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1 real time communication between said user and said remote
2 object source employing a selection from a set of open-ended
3 network technologies and network providers, said
4 communication means being selectable without substantive
5 change to said information product.

1 **Claim 17.** An information transport component according to
2 claim 1 wherein said remote object source comprises a remote
3 server capable of establishing real time communication with
4 said information transport component for object transport.

1 **Claim 18.** A information transport component according to
2 claim 1 wherein said information product is a collection of
3 issues of a periodical publication and said pre-identified
4 object comprises an update issue.

1 **Claim 19.** An information transport component according to
2 claim 1 wherein said information product is a software
3 application and said pre-identified object comprises an
4 upgrade for said software application.

1 **Claim 20.** An information transport component according to
2 claim 1 supplied as a free-standing embeddable component for
3 incorporation in an information product said information
4 transport component comprising only such functionality as is
required for said information object transport operation.

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1 Claim 21. An information transport component according to
2 claim 1 wherein said real time communication has a software-
3 controlled duration confined to a period sufficient to
effect said unattended object transfer.

1 Claim 22. A computer-implemented electronic information
2 product comprising information content and an information
3 transport component according to claim 1.

1 Claim 23. A computer-implemented information transport
2 software component separately suppliable for use with any
3 one of multiple electronic information products for mass
4 distribution of electronic information objects from users of
5 a diversity of uncoordinated communications-equipped
6 computer stations by enabling said users to send an
7 electronic information object to a remote center specified
8 with said information product, in an online send operation
9 proceeding in unattended mode after activation, said
10 information transport software component being readily
11 customized to an individual information product to have a
12 user interface in said information product for activation of
13 unattended transport of an information object from said
14 user's computer station to said remote center, said user's
15 station being ^{entered} in ^{to} real time communication with said remote
16 sender wherein said information transport component contains
17 a user communications module having user protocols

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1 **Claim 24.** An information transport component according to
2 claim 23 wherein said electronic information product
3 comprises a merchant's product disclosure and said send
4 object comprises a user's order electronically prepared from
5 said product disclosure whereby said order can be placed
6 with said remote center electronically in unattended mode
7 without requiring a voice call.

8 a) a user interface in said information product for
9 activation of unattended transport of at least one

1 said information object; and
2 b) a user communications module cooperative with and
3 known to a remote center communications module
4 said user and remote center communications modules
5 effecting unattended online transport of said
6 information objects after activation;
7 wherein said information transport component comprises only
8 such functionality as is required for said transport of said
9 information objects.

1 **Claim 26.** A transporter according to claim 25 operative to
2 provide unattended information object transport only between
3 an aforesaid user and at least one remote address, said at
4 least one address being pre-specified to the transporter and
5 including an address for said remote center.

1 **Claim 27.** An electronic information product distribution
2 remote server for use in transporting information objects to
3 multiple information transport components according to claim
4 1 located at said remote center and being supplied with said
5 source communications protocols.

1 **Claim 28.** A distribution server according to claim 27 in
2 combination with a link to a remote vendor, whereby said
3 users can transport objects to or from said vendor via said
4 distribution server.

1 **Claim 29.** A distribution server according to claim 27 said
2 server being gatewayed to other information object sources.

1 **Claim 30.** A method of distributing predetermined electronic
2 information objects from a remote object source to users of
3 a diversity of uncoordinated communications-equipped
4 computer stations, said method comprising:

- 5 a) supplying said users with a separable information
6 transport component containing user communications
7 protocols specifying user station functions of a
8 specified object transport operation; and
9 b) supplying said remote object source with a source
10 information object and source communications
11 protocols specifying source functions of said
12 unattended object transport operation, said source
13 communications protocol being co-operative with
14 said user communications protocol to effect said
15 pre-specified information object transport
16 operation;

17 whereby said transport operation can proceed in unattended
18 mode after initiation at said user's station.

1 **Claim 31.** A method according to claim 30 wherein after setup
2 of a containing information product and a simple menu-
3 selection activation of a transport operation said
4 information transport component effects said transport

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ADD/CA

**DECLARATION FOR SINGLE INVENTOR
FOR PATENT APPLICATION**

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor of the subject matter which is claimed and for which a patent is sought on the invention entitled "COMPUTER-IMPLEMENTED TRANSPORT OF ELECTRONIC INFORMATION OBJECTS"

", the specification of which is attached hereto unless the following box is checked:

[] was filed on _____ as United States Application Number or PCT International Application Number _____ and was amended on _____ (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56. I hereby claim foreign priority benefits under Title 35, United States Code, Section 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

Prior Foreign Application(s)

		Filed	Priority Claimed
_____ (Number)	_____ (Country)	_____ (Day/Month/Year)	[] Yes [] No
_____ (Number)	_____ (Country)	_____ (Day/Month/Year)	[] Yes [] No
_____ (Number)	_____ (Country)	_____ (Day/Month/Year)	[] Yes [] No

I hereby claim the benefit under Title 35, United States Code, Section 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, Section 112, I acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations, Section 1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

(Application Number)

(Filing Date)

(Status¹)

(Application Number)

(Filing Date)

(Status)

I hereby appoint Anthony H. Handal, Reg. No. 26,275; Ernest Gergely, Reg. No. 25,584; and John Andres, Reg. No. 30,921 as my attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith.

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(203) 838-8589

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Handal & Morofsky
80 Washington Street
Norwalk, Connecticut 06854
Facsimile (203) 838-8794

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Full Name of sole inventor (given name, family name) Richard R. REISMAN

Inventor's signature *Richard R. Reisman* Date 5/27/94

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Citizenship United States of America

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[] Additional inventors are being named on separately numbered sheets attached hereto.

¹. Please specify patented, pending or abandoned.

Applicant or Patentee: RICHARD R. REISMAN
Serial No.: Unknown
Attorney's Docket No.: REISMAN
Filed: Herewith
For: "COMPUTER-IMPLEMENTED TRANSPORT OF ELECTRONIC INFORMATION OBJECTS"

VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY
STATUS (37 CFR 1.9(f) and 1.27(b))-INDEPENDENT INVENTOR

As a below named inventor, I hereby declare that I qualify as an independent inventor as defined in 37 CFR 1.9(c) for purposes of paying reduced fees under section 41(a) and (b) of Title 35, United States Code, to the Patent and Trademark Office with regard to the invention entitled "COMPUTER-IMPLEMENTED TRANSPORT OF ELECTRONIC INFORMATION OBJECTS" described in

- ☒ the specification filed herewith
☐ application Serial No. _____, filed _____
☐ patent No. _____, issued _____

I have not assigned, granted, conveyed, or licensed and am under no obligation under contract or law to assign, grant, convey or license, any rights in the invention to any person who could not be classified as an independent inventor under 37 CFR 1.9(c) if that person had made the invention, or to any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 CFR 1.9(e).

Each person, concern or organization to which I have assigned, granted, conveyed, or licensed or am under an obligation under contract or law to assign, grant, convey, or license any rights in the invention is listed below:

- ☒ no such person, concern, or organization
☐ persons, concerns or organizations listed below

NOTE: Separate verified statements are required from each named person, concern or organization having rights to the invention averring to their status as small entities. (37 CFR 1.27)

FULL NAME _____
ADDRESS _____

☐ INDIVIDUAL ☐ SMALL BUSINESS CONCERN ☐ NONPROFIT ORGANIZATION

FULL NAME _____
ADDRESS _____

☐ INDIVIDUAL ☐ SMALL BUSINESS CONCERN ☐ NONPROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 CFR 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

Richard R. REISMAN
Name of Inventor
[Signature]
Signature of Inventor
5/27/94
Date

Name of Inventor

Signature of Inventor

Date

Name of Inventor

Signature of Inventor

Date